
Quick Summary of ME/MC tuning meeting from 10/4/02

J. Huston

...but first, the paper of the week

- [hep-ph/0209271](#), Color Flow Decomposition of QCD Amplitudes; F. Maltoni, K. Paul, T. Stelzer, S. Willenbrock: a new color decomposition for multi-parton amplitudes in QCD is discussed which has a physical interpretation in terms of flow of color; this makes it ideal for merging with parton shower Monte Carlo programs. The color flow decomposition allows for very efficient evaluation of amplitudes with many quarks and gluons, many times faster than the standard color decomposition. Examples such as $gg \rightarrow 10\ g$ (never before calculated) are given.

Agenda

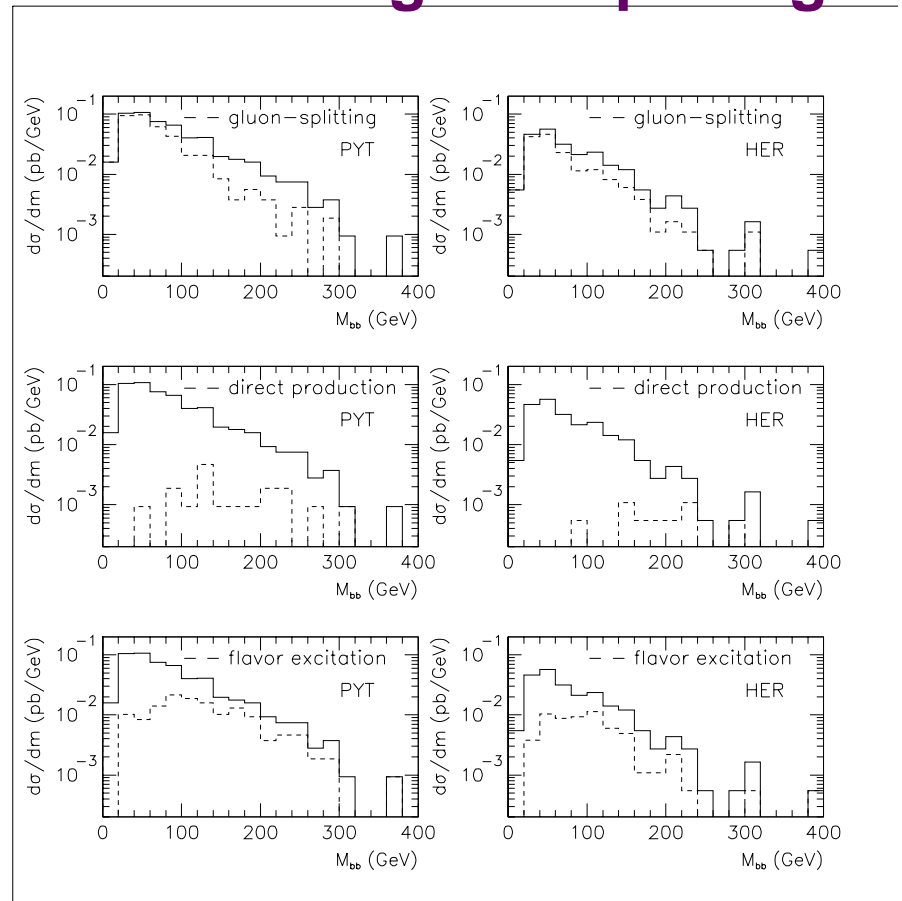
Copies of the transparencies can be found at:

<http://www-pat.fnal.gov/personal/mrenna/tuning/agenda.html>

- Introduction & Setting of Goals for Workshop Stephen Mrenna
 - Using Ratios as More Precise Measurables at Hadron Colliders Henry Frisch
 - Matrix Element - Monte Carlo comparisons Gervasio Gomez
 - The HERA experience Markus Wobisch
 - POMWIG: HERWIG for diffractive interactions Brian Cox
 - Min-Bias and the Underlying Event at the Tevatron and the LHC Rick Field
 - D0 Min Bias Comparisons Avto Kharchilava
 - D0 Low Et Jet Comparisons John Krane
 - B production in multijet events: Data and Pythia, Herwig simulation Alberto Annovi
 - Future directions Joey Huston
 - Wine & Cheese Rick Field
- Toward an Understanding of Hadron-Hadron Collisions: From Feynman-Field until Now

Alberto Annovi

- 6jet of which 2b-jet $\Sigma P^T > 250$ GeV: Problems with gluon splitting
- Pythia & Herwig
- Direct production is negligible



Multijet QCD background

- Physics background Pythia Xsec
- study sample Data Xsec

- pp $b\bar{b}\phi$ bbbb 4 bjet+X 30
- pp VH bbqq 2bj+2jet 10
- tt bbqqqq 2bj+4jet 15

- The World doesn't know about this!!!

John Krane: low E_T multi-jet cross sections

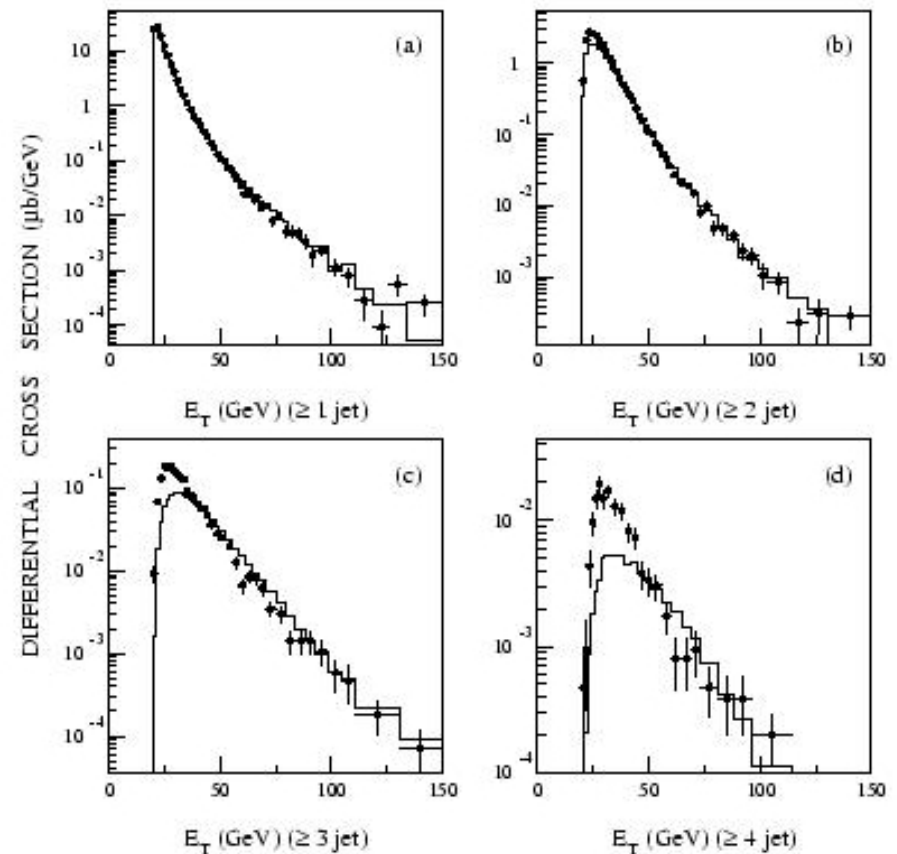
Data and Pythia

Inclusive xsec looks fine

Multijet xsecs exhibit
deviations from Pythia

Let's pretend it's physics

Histograms are Pythia



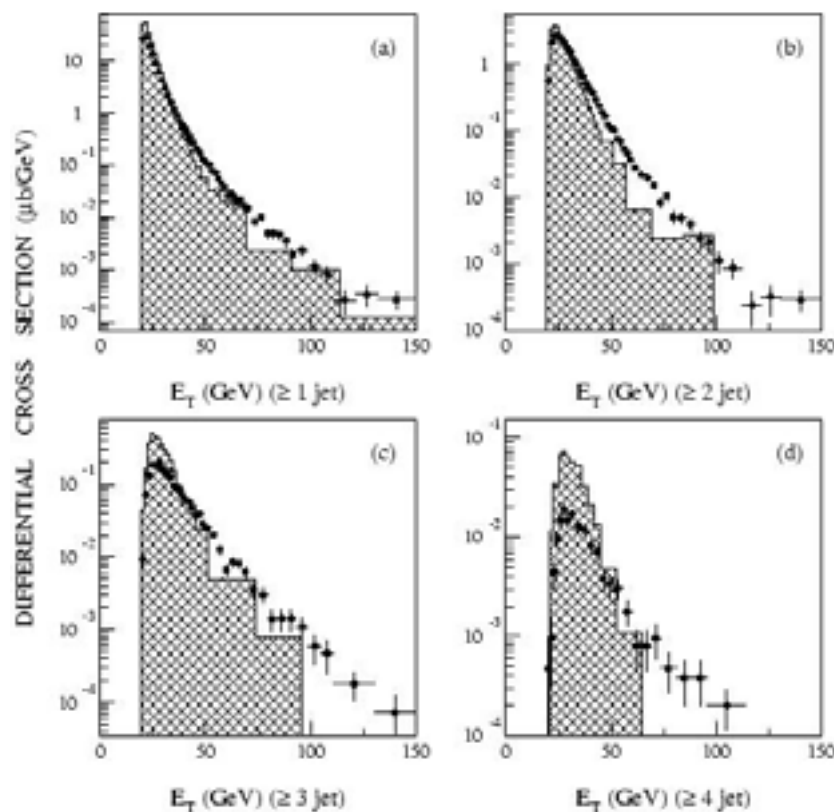
Herwig

Data and Herwig

Started generating jets at
0.5 GeV

Multijet xsecs exhibit
similar deviations

histograms are Herwig



Data and Tuned MC

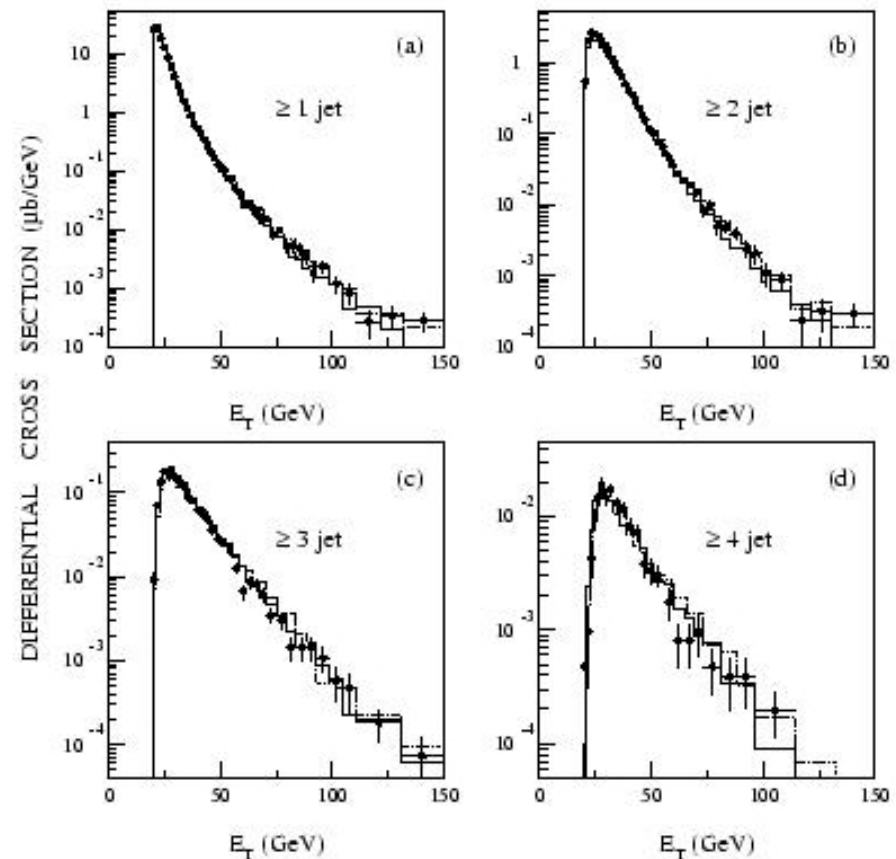
- Signs point to initial state radiation effects in data

- ◆ DGLAP style?

- ◆ BFKL style?

- ...or a need to tune the MC

points = data
solid = Pythia
dashed = Herwig

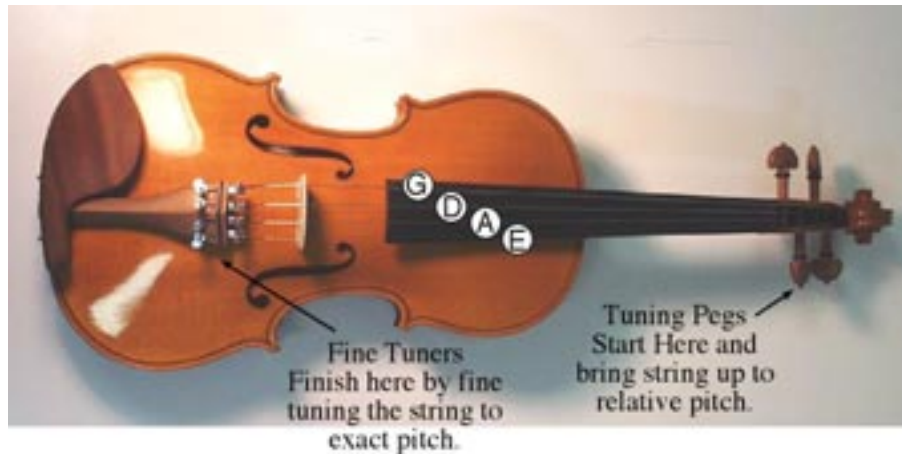


ME/MC Tuning Workshop
J. Huston

Matrix element/Monte Carlo

- Matrix Element/Monte Carlo programs are becoming increasingly important tools for Run II physics
 - ◆ the Les Houches accord for interfacing between matrix element and Monte Carlo programs has greatly increased their flexibility and usefulness
- The motivation for organizing this ~~workshop~~ journal club was to bring together interested parties in CDF/D0/theory to share ideas and expertise, and to reduce duplication of effort
- ...this is a motivation shared by others given the attendance today

Even though we may have different ideas of tuning

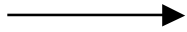


A Bart Reiter banjo available
for \$693 from Elderly Instruments



ME/MC Tuning Workshop
J. Huston

-
- If this is valuable, how do we keep this from fizzling out? We've seen that CERN is approaching this problem in a systematic way.



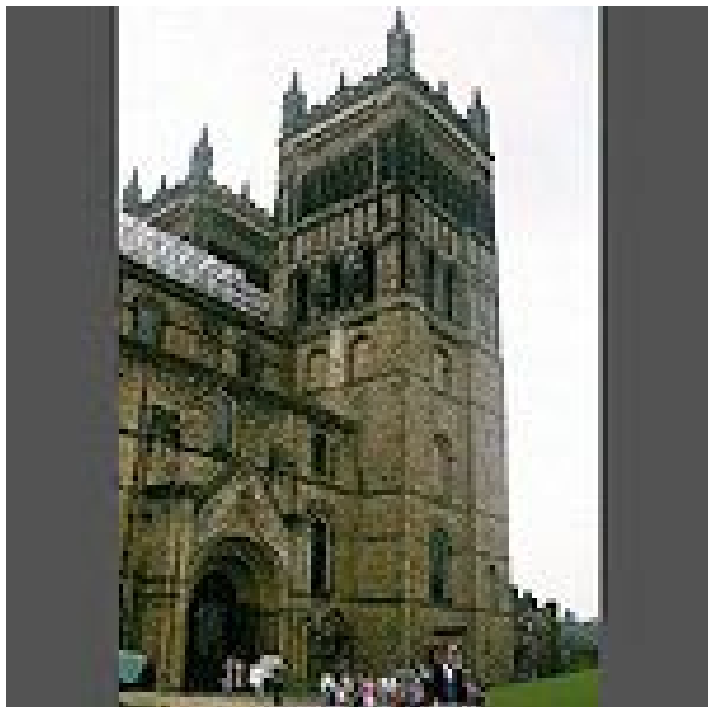
- Meet on a regular basis, every 5 to 6 weeks with live streaming being available for every meeting (if possible)
- Next meeting is Friday Nov. 15 in 1-West
 - ◆ Speakers include:
 - ▲ Michelangelo Mangano on ME tunings
 - ▲ Claudio Ferretti on ROOT interfaces to ALPGEN
 - ▲ Steve Vejcik on gluon radiation in ttbar events in data and Monte Carlo
 - ◆ Send an email if you would like to talk

Webpage

- We will also maintain a central webpage (along with an email distribution list) that includes handy references to standard tunes and useful tools and pointers to programs, as well as copies of all talks given at these meetings
- Plus we will schedule workshops in exotic locations with good weather like...

Workshop at Durham

The IPPP has now moved into the new Ogden Centre for Fundamental Physics building!



- Matrix Element and Parton Showering Monte Carlos

◆ Week of Jan. 13, 2003



University of Durham